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# Family Socialization and the IQ Test Performance of Traditionally and Transracially Adopted Black Children

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The purpose of this research was to investigate the efficacy of the difference orientation for interpreting black children's lower average intelligence test performance. This study examines the response styles to cognitive demands of the Wechsler Intelligence Scale for Children (WISC) exhibited by two groups of adopted black children, aged from 7 to 10 years at the time of testing, and their average IQ. One group had been adopted by middle-class white families (i.e., transracially adopted), and the second group had been adopted by middle-class black families (i.e., traditionally adopted). A significant difference in the average performance of the two groups of children was observed, favoring those adopted by white families. Multivariate analysis of variance indicated significant differences in the styles of responding to test demands demonstrated by the two groups of black children, which are conceptualized as contributors to the difference in average test score observed between them. Multivariate analysis of the helping behaviors adopted mothers exhibited when helping their children solve a difficult cognitive task revealed significant differences between black and white mothers, which are conceptualized as culturally determined.

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A considerable amount of research has been focused on the identification of factors that contribute to differences in black and white children's scholastic achievement. White children are generally more successful in the development of school-intensive skills than their black peers (Blau, 1981; Burton & Jones, 1982; Coleman et al., 1966). Much of the research in this area has been guided by the assumption that black children are deficient in the cognitive skills necessary to benefit from formal school instruction (see a review by Horowitz & Paden, 1973).

The assumption that black children are deficient in cognitive skills necessary for success in school is based, in large part, upon the consistently observed differences in the average IQ of black and white children. Generally, black children achieve lower average scores on standardized tests of intelligence than their white peers, even when socioeconomic status (SES) is controlled (Hall & Kaye, 1980; Nichols & Anderson, 1973; Trotman, 1977).

Proponents of the deficit interpretation of black children's intelligence test performance differ in their conceptualizations of the factors that contribute to their lower IQ. Some posit that the black rearing environment fails to provide stimulation and experiences necessary for optimal cognitive skill development (see reviews by Deutsch, 1973; Hess & Shipman, 1967; Silverstein & Krate, 1975). Others theorize that a significant genetic component is involved (Jensen, 1969; Shockley, 1973). However, those who subscribe to the deficit interpretation of black children's IQ performance generally agree on two assumptions underlying the traditional use of intelligence tests. The first is that intelligence tests yield valid and reliable estimates of the intellectual functioning of all children; and, second, apparent differences in functioning indicated by test scores play an important causal role in differential school achievement (Eckberg, 1979).

The tenability of the deficit assumption when applied to the interpretation of black children's lower average IQ and scholastic achievement has been challenged by theorists who subscribe to what is termed the "difference orientation" (Yando, Seitz, & Zigler, 1979). Proponents of this approach posit that children from different ethnic groups vary in their learning experiences, learning styles, language, learning attitudes, and achievement orientations as a result of the socialization provided by their families and communities (Baratz & Baratz, 1970; Cole & Bruner, 1971; Gay & Abrahams, 1973; Labov, 1972; Massey, Hilliard, & Carew, 1982; Mercer, 1974; Yando et al., 1979). In the judgment of these theorists, traditional intelligence tests assay children's familiarity with and conformity to a single cultural tradition—that of middle-class Anglo Americans. The use of a single standard to estimate the cognitive functioning of all children places those socialized in different cultural traditions at a significant disadvantage because they are not given credit for knowledge and behavioral styles derived from their particular experiences. Therefore, the average lower performance of black children on such measures is possibly an artifact of the test content and procedures.

Although available research findings suggest a connection between subcultural experiences and cognitive performance (Scarr

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& Weinberg, 1976), there has been relatively little systematic inquiry into what these subcultural differences are and how they may relate to group differences in IQ test performance. Of notable exception is the work of Hertzig, Birch, Thomas, and Mendez (1968), which analyzed stylistic differences between working-class Puerto Rican and middle-class white preschoolers in their responses to the cognitive demands of the Stanford-Binet intelligence test. The results from this study indicated significant differences in the behavioral styles manifested by the two groups of children, such as the tendency to attempt a response to test demands, to express responses verbally, and styles of making nonwork responses. All differences in response styles observed were evident when the two groups' IQ scores were similar. Differences in the scores of the middle-class white children did not predict substantial differences in their style of responding; however, in the Puerto Rican group, the lower scoring children responded more "exaggeratedly" in the style that characterized the group as a whole. Based upon qualitative explorations of the two groups' home environments, these researchers hypothesized that the stylistic differences observed between them were attributable to differences in the cultural styles of their families.

The Hertzig et al. (1968) study is particularly important because it represents one of the first empirical examinations of the influence of subcultural experiences on children's test performance. This work, with its focus on "how" children from different ethnic groups respond to cognitive demands, as opposed to just "how well" they achieve on such tasks indicates one approach to testing the hypothesis advanced by Cole and Bruner (1971)—that children from different ethnic groups come to the testing situation with different sets of skills, attitudes, and strategies for negotiating the test situation that influence their test achievement.

The influence of socioeconomic status on obtained results was not controlled in the Hertzig et al. (1968) study. Therefore, it is not clear to what extent response style differences between the working-class Puerto Rican children and the middle-class white children were a function of ethnicity or SES. If SES had been controlled, there would be a much stronger case for the independent influence of ethnicity on styles of children's responding and test achievement.

The purpose of the research reported here was to investigate the efficacy of the difference orientation for interpreting black children's lower average intelligence test performance. The first phase of this investigation examined the response styles to the cognitive demands of the Wechsler Intelligence Scale for Children (WISC)[1] of a group of socially classified black children adopted by middle-class white families (i.e., transracially adopted children), and a group of socially classified black children adopted by middle-class black families (i.e., traditionally adopted children), and differences in the average IQ of the two groups of black children. The second phase of this investigation was designed to examine the socialization of problem-solving skills and affect demonstrated by the two groups of adoptive mothers, and the consequences of variations in this area of socialization for the children's WISC performance.

The cross-fostering component of this design (i.e., black children adopted by white families) is essentially a replication of that used by Scarr and Weinberg (1976) in their study of the malleability of black children's IQ test achievement. These investigators compared the average IQ observed for transracially adopted children to that of the general population of black children reared by their biological parents in the geographic region from which the adoptive sample was drawn. The results indicated a significant score advantage among black children reared by white families.

The present investigation compares the mean IQ test performance and response styles of transracially and traditionally adopted black children. There are several advantages to the use of these two types of adoptive samples as we attempt to understand the potential significance of cultural differences in rearing environments for black children's IQ test achievement. It is the case that adoption agencies attempt to place children in the best home available in terms of both the SES characteristics and socioemotional climate of the prospective homes. This practice tends to reduce the variation between black and white adoptive families on the SES characteristics typically used to index the stimulation potential of the rearing environment. It also diminishes the potential effects of family disorganization and multiproblem socioemotional climate, which researchers have consistently associated with the black rearing environment (see critical review by Slaughter & McWorter, 1985). Therefore, the adoptive samples permit a focus on *processes* within the two ethnic rearing environments that may be culturally determined, and may differentially affect black children's IQ test performance.

## Phase 1

### *Method*

*Subjects.* The sample comprised 46 socially classified black children. Of these, 23 children were adopted by black families (i.e., traditionally adopted), and 23 were adopted by white families (i.e., transracially adopted). All the children were placed in their adoptive families by the same two adoption agencies, and all were placed in their adoptive families by Age 2. The children were between 7 and 10 years old at the time of data collection. In the transracially adopted sample, the average age of the children was 103.35 months, or 8.61 years, with a standard deviation of 10.54 months, and a range of from 86 to 129 months. The average age of the children in the traditionally adopted sample was 103.39 months, or 8.62 years, with a standard deviation of 7.59 months and a range of from 93 to 121 months. The transracially adopted sample consisted of 10 males and 13 females, and included in the traditionally adopted sample were 14 males and 9 females.

Although all the children included in the sample are socially classified as black, biracial children (i.e., children with one black and one white biological parent), and black children (i.e., children with two black biological parents) were not normally distributed across the two types of adoptive placements. Of the socially classified black children adopted by white families 14 were biracial, and of the socially classified black children adopted by black families 6 were biracial. Discussions with the adoption agency personnel who were responsible for the placement of all of the 46 children included in this sample revealed that the disproportionate placement of biracial children in white homes did not occur by chance. Most of the black adoptive parents had expressed a clear preference for non-biracial black children because they wanted children who would resemble them in physical appearance. However, the white adoptive par-

[1] The WISC was used in this investigation instead of the WISC-R in order to maintain continuity between the results reported by Scarr and Weinberg (1976) and the present investigation. The WISC-R has higher norms than the WISC.

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Table 1
*Dictionary of Child Responses to Test Demands and Interscorer Reliabilities*

| Behavior | Definition | Reliability |
|---|---|---|
| I. Work | Child attempts a response to the demand | .98 |
| A. Verbal | Child responds to demand verbally | .96 |
| 1. Spontaneous extension | Child's response is accompanied by unsolicited elaborations related to the task at hand | .93 |
| 2. Delimitation | Work response restricted to the defined requirements of the task | .94 |
| B. Nonverbal | Child responds to task demand without saying anything | .96 |
| 1. Spontaneous extension | Child's response accompanied by unsolicited elaborations related to the task (e.g., child forms the picture of a face and then makes a face at the picture as if looking in a mirror). | .92 |
| 2. Delimitation | Work response restricted to the defined requirements of the task | .98 |
| II. Not-work | Child failed to work at the task presented | .96 |
| A. Verbal | Child's not-work response verbally expressed | .94 |
| 1. Negation | Direct refusal to work such as "No" or "I don't like to do this" | .98 |
| 2. Substitution | Child offers irrelevant verbalization instead of engaging in task-directed activity (e.g., "Can I see your ring?" or sings a popular song) | .92 |
| 3. Refusal in terms competence | Child makes a statement referring to limitation of ability to perform task (e.g.,, "I don't know how" or "This is too hard for kids my age") | .96 |
| 4. Requests aid | Child asks the tester for help (e.g., "Does this go here?") | .98 |
| B. Nonverbal | Child expressed not-work response without using words | .83 |
| 1. Negation | Motor responses directly reflecting refusal to participate such as shaking head no or turning away from the table | .96 |
| 2. Motor substitution | Child engages in some irrelevant physical activity such as playing a finger game | .78 |

ents generally expressed a desire to adopt a black child and did not indicate a specific preference for either a biracial or non-biracial black child.

All the adoptive families were identified as middle class using the Duncan Socio-Economic Index (SEI; Reiss, Duncan, Hatt, & North, 1961) observed for the highest ranking adoptive parent as the basis for classification. The average SEI score observed for the black families was 63.5, and for white families, 70.3. Both groups of adoptive mothers were similar in their distribution of educational attainment, with an average educational level of 16.0 years. The average educational attainment of the black adoptive fathers was 15.6 years; it was 17.3 years for the white adoptive fathers.

Although the SEI scores observed for both white and black adoptive families place them all in the middle class, the difference in the average score observed for the white families is significantly higher ($p < .05$) than that observed for the black families. The white adoptive fathers also had significantly higher educational attainment ($p < .05$) than the black fathers.

The sample was developed from a larger group of adoptive families that were either currently participating or had previously participated in a longitudinal study conducted by one of the placement agencies. A review of the agency records indicated no significant differences in socioeconomic status, maternal education, child's age at placement, characteristics of children's biological mothers, and children's health between families who chose to participate in this study and those who did not.

*Procedure.* All data collection procedures were implemented in the children's homes. The decision to conduct the testing and observation sessions in the home was made to maintain consistency between the data collection procedures employed by the agency in their research with the families and this investigation. All testing of the children and interviews of the adoptive parents and children that the agency had done in the previous 4 years of its research had occurred in the children's homes.

By the time of the home visits by researchers involved in this research, adoptive parents had been informed, by mail and by phone, of the types of data that would be collected and about the physical conditions necessary for the data collection process. The home visits were scheduled for times that were convenient for the mothers and children. The only requirement for scheduling set by the investigator was that the agreed-upon time be one in which the child was well rested and alert. Consequently, most of the home visits were scheduled for midmorning. All data reported here were collected between Fall 1977 and Spring 1979.

Each of the adopted children was administered the WISC. One tester administered this test to all children in the sample. This tester was a black female, in her late 20s, formally trained in the administration of the WISC. One observer, also a black female, was present at the time each child was administered the WISC to record the behavior and verbalizations of the child in response to each test demand presented by the tester during the test session. A tape recording of all the child's verbalizations during the test session was also made. Neither tester nor observer was aware of the purpose of this research.

*Scoring of behavior protocols.* Once behavior records were completed by the observer, and checked against tape-recorded data, they were independently scored by two scorers using the system developed by Hertzig et al. (1968) for standardized intelligence test observation[2] (see Table 1 for a listing of the behaviors and definitions). In scoring a protocol, each unit of behavior is considered and classified. Units are scored in sequence, and the order in which the kinds of behavior occurred is noted. A sequence is defined by a task demand and by behaviors from the first response to a given demand up to the presentation of the next task. Repetition of a task demand is considered part of the sequence. This scheme of observation permits classification of initial responses, as well as sequential analysis of response chains. Interscorer reliabilities (the number of agreements divided by the number of disagreements plus agreements for each behavior) ranged across the separate behaviors from .94 to .78 (see Table 1).

## Results

*IQ differences.* The traditionally adopted black children in the current sample achieved a mean WISC full-scale score that places them in the normal range of ability. However, the transracially adopted black children showed nearly a standard deviation full-scale scoring advantage over their traditionally adopted peers, as shown in Table 2. The transracially adopted children showed a similar level of advantage in average scores on both the WISC performance and verbal scales (Moore, 1985).

[2] No child in this sample was observed to make a motor request for aid or passive not-work response. These response categories were therefore omitted from the analysis.

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Table 2
*Mean Full-Scale WISC Scores By Adoptive Status, Racial Admixture, and Sex*

| Racial admixture | *n* | Score *M* | Score *SD* |
|---|---|---|---|
| Traditional (interracial) adoption | | | |
| Females | | | |
| Black | 7 | 105.9 | 10.0 |
| Biracial | 2 | 102.0 | 1.0 |
| Males | | | |
| Black | 10 | 100.8 | 11.5 |
| Biracial | 4 | 107.5 | 12.6 |
| All | 23 | 103.6 | 11.4 |
| Transracial adoption | | | |
| Females | | | |
| Black | 5 | 118.4 | 8.1 |
| Biracial | 8 | 117.8 | 7.9 |
| Males | | | |
| Black | 4 | 117.5 | 13.1 |
| Biracial | 6 | 114.7 | 8.7 |
| All | 23 | 117.1 | 9.4 |

*Note.* WISC = Wechsler Intelligence Scale for Children.

In the present sample, no significant difference was observed in the average WISC scores of biracial children and those with two black biological parents in either adoptive placement. The mean full-scale WISC score of the biracial children in the traditional adoptive sample was 105.7, which is 2.8 points higher than that observed for the non-biracial children. However, this difference is not significant. In the transracial sample, the average performance of biracial children was 116.5, and the non-biracial children scored 118.0.

*Response style differences.* To assess response style differences between the transracially and traditionally adopted black children, the observed frequencies of behavior in each category scored for each child were transformed to logits using the multivariate logistic transformation advocated by Bock (1975). This transformation of raw frequencies was employed because the logits are unbounded, and their means in samples "will tend to multivariate normality more quickly than will those of untransformed response probabilities" (Bock, 1975, p. 552). Additionally, contrast ratios were computed among the categories of child behaviors because this was the most efficient and informative strategy for organizing these data in view of the structural relationships among the categories scored (See Table 3 for contrast ratios computed between behavior categories and variable mnemonic used to index the ratio in subsequent analyses).

Multivariate analysis of variance (MANOVA) was used to investigate differences in the response styles to cognitive demands observed for the two groups of adopted black children. The design in this study was generated by the crossing of the sex of the child; child's age (<102 months and >102 months); adopted mother's educational attainment (<16 years and ≥16 years); full-scale WISC score (<110 and >110); and adoptive status (white family and black family) classifications. The model fitting was carried out using the MULTIVARIANCE program, developed by Finn (1978).

The MANOVA of the 10 response style contrasts by the independent variables revealed no significant three-way or two-way interaction effects. Significant main effects were observed for the age of the child, $F(10, 25) = 4.2743$, $p < .0016$; full-scale WISC score, $F(10, 25) = 4.7625$, $p < .0008$; and adoptive status, $F(10, 25) = 32.3254$, $p < .0001$. Multiple orderings of these factors in the test model were performed, and each achieved multivariate significance regardless of the ordering.[3]

The univariate *F*s that contributed to the multivariate significance of adoptive status were those observed for the variables work, $F(1, 24) = 64.914$, $p < .0001$; not-work–verbal, $F(1, 24) = 73.684$, $p < .0001$; verbal delimitations, $F(1, 24) = 16.905$, $p < .0003$; nonverbal delimitations, $F(1, 24) = 6.238$, $p < .01$; competence versus aid, $F(1, 24) = 13.416$, $p < .001$; competence versus substitutions and negations, $F(1, 24) = 17.699$, $p < .001$; verbal negations, $F(1, 24) = 9.548$, $p < .005$; verbal substitutions, $F(1, 24) = 5.424$, $p < .05$; and initial work, $F(1, 24) = 21.466$, $p < .0001$. The only response variable for which a significant difference was not observed between the two groups of black children was their tendency to express their work responses verbally.

The observed mean proportions of the two groups' responses for each behavior category are presented in Table 4. The transracially adopted children made a higher proportion of work responses to the WISC demands than did the traditionally adopted children; a higher proportion of the transracially adopted children's not-work responses were verbally expressed; and transracially adopted children provided a higher proportion of both verbal and nonverbal spontaneous extensions on their work responses.

The two groups of adopted black children differed in their styles of making not-work responses. A higher proportion of the transracially adopted children's not-work responses were expressed as refusals on the basis of competence. In contrast, the traditionally adopted children more often requested aid and provided negations and substitutions to test demands. When the transracially adopted children expressed their not-work responses as negations and substitutions, a higher proportion of these not-work responses were expressed verbally than was the case for the traditionally adopted children. Finally, the transracially adopted children more often followed initial not-work responses with work responses than was true for the traditionally adopted children; and the traditionally adopted children showed a greater tendency to follow initial work responses with not-work responses.

The univariate *F*s that contributed to the multivariate significance of the child's full-scale WISC score were those observed for the proportion of work responses, $F(1, 24) = 6.452$, $p < .05$, and the proportion of initial not-work responses followed by work responses, $F(1, 24) = 7.076$, $p < .01$. These variables have been discussed in relation to the main effects of adoptive status.

The only contrast variable that contributed to the multivariate

[3] The response style contrasts are nonorthogonal and therefore overlap in obtained significant univariate *F*s for the test of each main effect is observed. Because each dependent variable can be validly tested only once, the effects of each factor are discussed in the reverse order that they appear in the test model. Therefore, the effects of adoptive status are discussed first.

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Table 3
*Response Style Contrast Variables*

| Variable | Contrast ratio |
|---|---|
| Work | Total work responses − Total not-work responses/Total responses |
| Work–verbal | Total verbally expressed responses − Total nonverbally expressed responses/Total work responses |
| Not-work–verbal | Total verbally expressed not-work responses − Total nonverbally expressed not-work/Total not-work responses |
| Verbal delimitations | Total verbal delimitations − Total verbal spontaneous extensions/Total work responses |
| Nonverbal delimitations | Total nonverbal delimitations − Nonverbal spontaneous extensions/Total work responses |
| Competence vs. aid | Total refusal to work on basis of competence − Total requests for aid/Total not-work responses |
| Competence vs. substitution and negation | Total refusal to work on basis of competence − (Total substitutions + Total negations)/Total not-work responses |
| Verbal negations | Total verbal negations − Total nonverbal negations/Total not-work responses |
| Verbal substitutions | Total verbal substitutions − Total nonverbal substitutions/Total not-work responses |
| Initial work | Total initial work responses followed by not-work − Total initial not-work responses followed by work/total test demands |

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significance of age that has not been discussed to this point in connection with adoptive status and IQ is the tendency of the children to provide verbal work responses. Children who were older than 102 months (8.5 years) more often verbally expressed their work responses than did the younger children in the sample, $F(1, 24) = 12.593$, $p < .001$.

## *Discussion*

The results of the analysis of the average WISC scores obtained by transracially and traditionally adopted children are consistent with those observed by Scarr and Weinberg (1976). The findings indicate that variations in black children's intelligence test achievement are significantly influenced by the ethnicity of the rearing environment. As Scarr and Weinberg observed, the advantage in WISC performance observed for the transracially adopted children in this study appears to be the result of rearing in environments that are culturally relevant to the tests.

The finding of no significant difference in the average WISC performance of biracial and black children in either adoptive sample is not consistent with Scarr and Weinberg's (1976) research, which indicated significantly higher performance among biracial children. These investigators attributed the difference in performance between the biracial and black children in their sample, at least in part, to the fact that the black children were significantly older at the time of adoption than the biracial children. In the present investigation, there was no significant difference in the average age at placement of biracial and black children in either adoptive category. This may account for the lack of difference in WISC performance of biracial and black children in the present study.

The differences in responding to test demands exhibited by the traditionally and transracially adopted black children generally confirm Cole and Bruner's (1971) hypothesis that children reared in different ethnic groups approach the test situation with different attitudes and strategies for negotiating the test experi-

Table 4
*Mean Proportions of Children's Responses to Cognitive Demands*

| | Responses | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Independent variables | Work | Work-verbal | Not-work–verbal | Verbal delim. | Non-verbal delim. | Competence vs. aid | Competence vs. substitutions and negations | Verbal negations | Verbal substitutions | Initial work |
| Sex | | | | | | | | | | |
| Males ($n$ = 24) | .4737 | .2093 | .3561 | .6270 | .5248 | .0933 | .1550 | .1797 | .3124 | .2660 |
| Females ($n$ = 22) | .4762 | .2583 | .3781 | .5612 | .6462 | .1963 | .1225 | .1330 | .3470 | .1847 |
| Age | | | | | | | | | | |
| <102 months ($n$ = 23) | .4466 | .1691 | .3622 | .4896 | .4336 | .1440 | .1319 | .1589 | .3341 | .2528 |
| >102 months ($n$ = 23) | .5033 | .2942 | .3711 | .4231 | .7322 | .1501 | .1427 | .1559 | .3237 | .1945 |
| Full-scale WISC score | | | | | | | | | | |
| IQ < 110 ($n$ = 23) | .4390 | .2115 | .3423 | .4309 | .3578 | .1596 | .1532 | .1851 | .3100 | .3276 |
| IQ > 110 ($n$ = 23) | .5108 | .2618 | .3910 | .4818 | .8080 | .1345 | .1214 | .1276 | .3478 | .1196 |
| Adopted mother's education | | | | | | | | | | |
| <16 years ($n$ = 19) | .4780 | .2613 | .3668 | .4214 | .5534 | .1085 | .1343 | .1369 | .3331 | .2758 |
| >16 years ($n$ = 27) | .4728 | .2193 | .3664 | .4809 | .4629 | .2018 | .1394 | .1718 | .3260 | .2017 |
| Adoptive status | | | | | | | | | | |
| White family ($n$ = 23) | .5837 | .2241 | .4124 | .3258 | .2017 | .2010 | .1707 | .3109 | .3646 | .1331 |
| Black family ($n$ = 23) | .3661 | .2492 | .3209 | .8399 | .7094 | .0931 | .1039 | .0039 | .2932 | .2525 |

*Note.* Delim. = delimitations.

ence. The ethnicity of the rearing environment is related to black children's styles of responding to test demands.

The significance of response style differences between children in the test situation is that certain response styles may function to conceal children's underlying competence, whereas other styles result in more accurate estimates of competence. For example, if a child shows a tendency to not attempt a response when presented with a test demand, or to terminate initial work responses with not-work responses, the child's final score will necessarily be lowered because the terminal not-work response is treated as an incorrect response in the final score tally. The terminal not-work response also serves to lower the child's score by decreasing the child's opportunities to respond to subsequent items in WISC subtests, because the procedure requires that after a certain number of incorrect responses the tester must proceed to the next subtest. Although the terminal not-work response is treated as an incorrect response, it does not actually provide any empirical documentation of what the child does or does not know or of what the child can and cannot do. The only information available is that the child did not respond to the demand. The not-work response thus may be more an index of the child's willingness to retrieve information or to problem solve on demand, and less an index of accumulated knowledge and ability.

Children's tendency to spontaneously elaborate on their work responses may be a very important index of their level of involvement in task performance, strategies for problem solving, level of motivation to generate a correct response, and level of adjustment to the standardized test situation. For example, a child may not have learned the dictionary definition of the word "nuisance," but may be familiar with the word from some context. Once the child places the word in an experiential context, the meaning may be inferred and a definition constructed during testing (e.g., "Nuisance, um, that's what my teacher always calls me when I'm acting silly, um, it's something that bothers you, something that disturbs you, like flies; they're a nuisance when we go camping, right?"). The child's elaboration on the definition of a word can serve a number of purposes for the child and tester. First, it can provide feedback to the child on the efficiency with which the problem-solving strategy employed (in this case, association) can be used to generate correct responses to test items, and it can confirm that the tester understands why the child views the construction of the definition of nuisance as correct. The spontaneous extension may also serve as a tension release for the child. In providing the elaboration, especially when generating a response to a demand that challenges the child, the child verifies for him- or herself that based upon his or her understanding of the problem, the response is reasonable and acceptable.

The child's use of spontaneous elaborations on responses indicates to the tester that the child is task focused by virtue of the child's ability and willingness to overtly associate the problem with personal experiences. Such responses also indicate that the child is motivated to provide appropriate responses to the problems that the test poses and is sufficiently relaxed in the test situation to explore different strategies for generating solutions to the problem.

The children who tended to provide spontaneous extensions on their work responses were also the children who made a higher proportion of their not-work responses in terms of competence. Typically, the response was of the sort, "I haven't learned that yet"; "I don't think kids my age are supposed to know that"; "I don't think anybody could find anything missing from this picture"; and the like. These types of not-work responses do not place the inability to generate a correct response on "self's" relative capacity or potential to know, but in experiential terms (i.e., "I haven't had the chance to learn that yet"). If the child takes this attitude when confronted with problems that he or she cannot solve, the child will not be disheartened by not knowing the answers to five consecutive questions, which is likely to occur in view of test procedures. Children who take this attitude toward the items they cannot solve may continue to strive for correct answers to subsequent test demands because they believe in their ability to solve problems they view as appropriate to their range of knowledge.

If the child refuses to work on the basis of competence, and competence is defined in terms of deficiencies in "self's" potential to know, which a simple "I don't know" may indicate, the child may be dismayed by a series of questions for which correct responses cannot be generated. If this is the case, the child may develop negative affect toward the test situation and look for ways to escape it. Shaking the head "no" in response to a question before the tester completes it, or asserting "I don't like to do this" or playing finger games when confronted with a test demand (i.e., substitutions) may be viewed as the child's attempt to escape the test situation.

A number of investigations have indicated that black children's scores on IQ tests can be increased by as many as 10 points if the testing situation is altered to optimize their success and reduce their anxiety (Seitz, Abelson, Levine, & Zigler, 1975; Zigler, Abelson, & Seitz, 1973; Zigler & Butterfield, 1968). These researchers report that if easy and hard items are mixed, and if the child is given more time and greater encouragement, an increase in performance is obtained. The increases in black children's test achievement found in these experimental studies are not due to alterations in the specific skills they possess, but rather to accommodation to their styles of responding to test demands.

## Phase 2

Family socioeconomic status indexes have been related to the amount, variety, and complexity of stimulation that mothers provide their children (Jordan, 1978; Tulkin & Kagan, 1972). They are also related to the style of interactions in the home, especially language behavior and maternal control styles (Bernstein, 1961; Blau, 1981) and to maternal teaching strategies (Hess & Shipman, 1965; Hess, Shipman, Brophy, & Bear, 1969; Laosa, 1982). All of these behaviors appear relevant to children's cognitive and affective development, both by shaping learning processes related to information management (Vygotsky, 1978) and by inducing a motivation to learn.

Although studies of this sort suggest the rearing conditions and experiences that influence the development of cognitive skills, they do not directly address the issue of how rearing environments influence differences between children in their willingness to retrieve information upon test demand, or to problem solve upon demand. That is, they do not indicate the factors that contribute to children's responses to situations in which their competence is measured.

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Table 5
*Dictionary of Maternal and Child Behaviors During Problem-Solving and Interscorer Reliabilities*

| Behavior | Definition | Reliability |
|---|---|---|
| | Maternal | |
| Approval | Expresses approval, gives love, comfort, positive acts that involve reactions to the child, and only indirectly the child's performance | .96 |
| Hostility | Expresses hostility, denigrates, makes sarcastic remarks, negative affective reactions to the child, and only indirectly the child's performance | .94 |
| Positive tension | Shows positive tension release, jokes, laughs, grins, behaviors focused toward the child, but are diffused, undirected reactions to the situation in general | .92 |
| Negative tension | Shows negative tension release, shows irritation, scowls, coughs, behaviors not focused toward the child, but are diffused, undirected reactions to the situation in general | .94 |
| Positive evaluation | Gives explicit positive evaluation of child's performance, indicates job well done | .92 |
| Negative evaluation | Gives explicit negative evaluation of child's performance, indicates job poorly done | .93 |
| Enthusiasm | Attempts to push up performance through expression of enthusiasm, urges, cheers on | .90 |
| Displeasure | Attempts to push up performance through expression of displeasure urges on indicating disappointment at speed and level of performance | .92 |
| Instructs, nonspecific | Gives nonspecific directions, gives hints, clues, general instructions about how to solve the task | .94 |
| Instructs, specific | Gives specific instruction, detailed information about how to do the task | .96 |
| | Child | |
| Requests aid | Asks for help, advice, or information | .94 |
| Rejects aid | Rejects help, advice, or information | .93 |
| Positive tension | Shows positive tension release (same as description for maternal category) | .98 |
| Negative tension | Shows negative tension release (same as description for maternal category) | .91 |

Rearing environments may differ in the direct and indirect training in problem solving they provide; the types of problems for which thoughtful, careful, and concentrated attempts at problem solving are specifically encouraged (i.e., task-oriented vs. person-oriented problems); and the identification of contexts in which problem-solving behavior will be rewarded. In other words, these aspects of the rearing environment may be dimensions of its cultural relevance to the test. The research literature pertaining to environmental influences on children's cognitive performance has not focused extensively on these potential sources of variance. The findings obtained in Phase 1 of this research indicate that such differences in rearing environments, which are not necessarily indexed by SES criteria, may be very important for understanding ethnic group differences in children's test achievement.

The second phase of this investigation was designed to test the hypothesis that black and white adoptive mothers of socially classified black children differ in their socialization of problem-solving behavior and affect. The specific focus was *how* the two groups of adoptive mothers help their children to solve a difficult cognitive task.

## Method

*Subjects.* The 46 socially classified black children adopted by black and white families comprised in the sample for Phase 1 of this study and their adopted mothers were used in this segment of the research.

*Procedure.* Observations of mothers' strategies for helping their children to perform a difficult cognitive task occurred over two 20-min. periods. At each observation session, the mother was asked to help her adopted child to perform a difficult block design from the Wechsler Bellevue Scale. Mother and child were told that they could work no more than 20 min. on the task initially but that the could continue working on it later if they did not complete the task within the initial 20 min. While mother and child worked on the problem an observer made a detailed protocol of all mother and child behaviors and verbalizations. Additionally, a tape recording of the mother's and child's verbalizations while working on the block design was made.

*Scoring behavior protocols.* Once behavior records were completed for each mother–child dyad and checked against tape-recorded data, they were scored independently by two scorers trained in the use of the categories of behavior for scoring parent–child interaction in the problem-solving setting developed by Rosen & D'Andrade (1959). In the Rosen and D'Andrade system, 10 maternal behaviors and 4 child behaviors are scored. The behavior categories scored, their descriptions, and interscorer reliabilities (the number of agreements divided by the number of disagreements plus agreements for each behavior) are presented in Table 5.

## Results

The observed frequencies of the mothers' and children's behavior in each category scored were transformed to multivariate logits. Contrast ratios were computed among the categories of maternal behaviors and among the categories of child behaviors. This was the most informative strategy for organizing these data in view of the structural relationships among the behavior categories scored for the mothers and the children. Table 6 shows the contrast ratios computed between behavior categories and the variable mnemonic used to index the contrasts in the analyses.

Multivariate analysis of variance was used to analyze the teaching and affective behaviors of the black and white adoptive mothers and the child behaviors coded. The test model for maternal behaviors included child's sex; child's age (<102 months and >102 months); WISC full-scale score (<110 and >110); adoptive mothers educational attainment (<16 years and ≥16 years); and adoptive status (white mothers and black mothers) as independent variables.

No significant three-way or two-way interactions among factors were observed in the analysis of maternal behaviors. Significant main effects were observed for child's full-scale WISC score, $F(5,$

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Table 6
*Maternal Behavior Contrast Variables*

| Variable | Contrast ratio |
|---|---|
| Approval | Expresses approval − Expresses hostility/Expresses approval + Expresses hostility |
| Positive tension | Positive tension release − Negative tension release/ Positive tension release + Negative tension release |
| Positive evaluation | Positive evaluation of child's performance − Negative evaluation of child's performance/ Positive evaluation + Negative evaluation |
| Enthusiasm | Attempts to push up child's performance through expression of enthusiasm − Attempts to push up child's performance through expression of displease/Enthusiasm + Displeasure |
| Hints | Gives nonspecific suggestions − Gives specific instructions/Nonspecific suggestions + Specific instructions |

27) = 9.3443, $p < .0001$, and adoptive status, $F(5, 27) = 15.9403$, $p < .0001$.

The univariate $F$s that contributed to the multivariate significance of adoptive status were those observed for the variables positive tension, $F(1, 31) = 16.7903$, $p < .0003$; positive evaluation, $F(1, 31) = 6.6343$, $p < .0152$; enthusiam $F(1, 31) = 10.0703$, $p < .0035$; and hints, $F(1, 31) = 39.8613$, $p < .0001$. Table 7 shows the observed mean proportions of these variables for each of the factors.

The results indicate differences between the black and white adoptive mothers in their affective and teaching behaviors. The white mothers tended to release tension by joking, grinning, and laughing, whereas the black adoptive mothers more often released tension in less positive ways such as scowling, coughing, and frowning. The white adoptive mothers also showed a greater tendency to provide positive evaluations of their children's problem solving efforts (e.g., "Gee, that's an interesting idea" or "You're good at this"). In contrast, the black adoptive mothers provided more negative evaluations of their children's performance (e.g., "You know that doesn't look right" or "That's not what you see here").

The two groups of mothers also differed in their strategies for encouraging their children's efforts, as indicated by their means for the variable enthusiasm. The white mothers more often used cheers and applause to push up their children's performance. The black mothers more frequenctly used expressions of displeasure at the child's performance to encourage their work (e.g., "You could do better than this if you really tried").

The way the mothers provided help to their children also distinguishes the two groups of adoptive mothers, as indicated by their means for the variable hints. The white mothers tended to provide aid to their children in the form of suggestions (e.g., "Why don't you work on it one section at a time") rather than giving them specific instructions in how to solve the design. The black mothers showed a greater tendency to give specific instructions on how to solve the problem (e.g., "That will work, but you have to turn it around like this" and shows the child how to turn the block).

The only variable that did not contribute to the multivariate significance of adoptive status was the variable approval. This variable was significantly related to the child's full-scale WISC score, univariate $F(1, 31) = 7.6813$, $p < .0095$. Mothers of children whose scores were less than 110 more often demonstrated behaviors coded as hostility toward their children in the problem-solving situation (e.g., "You're a real smarty pants, you don't listen").

The observed frequencies of the children's behavior in the problem solving situation were also transformed to multivariate logits and contrast ratios were computed for the variables requests aid and rejects aid, identified as "aid" in the analysis, and for the variables positive tension release and negative tension release, identified as "tension release" in the analysis. Using the same factors as included in the test model for the mothers' behaviors in the multivariate analysis of the children's behaviors, the only factor that achieved multivariate significance was adoptive status, $F(2, 39) = 5.2514$, $p < .0132$. The effect of adoptive status was only significant for the contrast variable aid, univariate $F(1, 40) = 8.8795$, $p < .0065$. The observed mean for the transracially adopted children for the variable aid was .2113, and the mean for the traditionally adopted children was .9441. This indicates that the black children adopted by black families showed a greater

Table 7
*Mean Proportions of Adoptive Mothers' Responses to Children's Problem Solving Behavior*

| Independent variables | Approval | Positive tension | Positive evaluation | Enthusiasm | Hints |
|---|---|---|---|---|---|
| Sex | | | | | |
| Males ($n$ = 24) | .3129 | .0253 | .0136 | .0235 | .0569 |
| Females ($n$ = 22) | .5636 | .0193 | .0370 | .1339 | .1939 |
| Age | | | | | |
| 102 months ($n$ = 23) | .4825 | −.0155 | .0509 | .0619 | .1268 |
| 102 months ($n$ = 23) | .3832 | .0075 | .0013 | .0908 | .1172 |
| WISC full scale score | | | | | |
| IQ < 110 ($n$ = 23) | −.1584 | −.0375 | −.2465 | −.1532 | .0206 |
| IQ > 110 ($n$ = 23) | 1.0240 | .0296 | .2960 | .3058 | .2234 |
| Adopted mother's education | | | | | |
| <16 years ($n$ = 19) | .4412 | .0133 | .0600 | .1598 | .1194 |
| >16 years ($n$ = 27) | .4269 | .0162 | .0010 | .0175 | .1239 |
| Adoptive status | | | | | |
| White mother ($n$ = 23) | .6117 | .0955 | .2667 | .3776 | .3050 |
| Black mother ($n$ = 23) | .5541 | −.1035 | −.2171 | −.2249 | −.0609 |

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tendency to request aid from their mothers than was observed for the black children adopted by white families.

## General Discussion

If the maternal behavior patterns noted in the brief observations reported here generalize to the everyday lives of these mothers and children, they may help to explain the response style differences observed for their children in the IQ test situation. The transracially adopted black children were much more assertive in their responding to test demands than their traditionally adopted peers. Often their spontaneous elaborations on their responses were advanced to explain the logic of their response and to convince the tester that it should be scored as correct. They showed confidence in themselves as problem solvers and a willingness to attempt a solution to a challenging demand, even at the risk of being wrong. Their styles of responding in the test situation suggest that they felt comfortable in such problem-solving situations and that they may actually enjoy the process. This orientation on the part of the transracially adopted children may be attributable, in part, to the positive affect and encouragement their mothers display toward such exercises, as indicated in the results from the observation of the mother's behaviors when they were helping their children solve the block design, particularly the implicit message in their behavior that "It's okay to be wrong as long as you are trying."

There was a tendency among the black adoptive mothers to be less supportive of child-initiated strategies that did not contribute to problem solution. These maternal behaviors may help explain their children's high proportion of not-work responses when confronted with test demands, particularly when their children were not sure of the answer. It may be that their children's problem-solving experiences and rewards have taught them that rather than guess at the answer to a challenging question and risk the disapproval of adults (such as the tester) for being wrong, it is better to say "I don't know" or request help from the tester as they did with their mothers in the observation sessions.

The results from this study indicate that the ethnicity of the rearing environment, not just socioeconomic status and maternal education level, exerts a significant influence on children's styles of responding to standardized intelligence tests and their test achievement. The effects of the ethnic rearing environment appear to be mediated, in part, by mothers through their socialization of affective orientations to impersonal problem-solving situations and the problem-solving strategies they encourage.

It is the case that the black and white adoptive families differed not only in ethnicity but also in average SEI scores and paternal education, even though they were all characterized as middle class. Whether these differences between the families within the social class category influenced the results obtained in this study cannot be determined. However, it should be noted that all the families, black and white, would be conceptualized as advantaged rearing environments on the basis of SES criteria typically used by researchers in this area.

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